PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P102890WO	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB 03/03201	International filing date *(day/month/year)* 24.07.2003	Priority date *(day/month/year)* 26.07.2002
International Patent Classification (IPC) or both national classification and IPC C08G73/02		
Applicant THE UNIVERSITY OF SHEFFIELD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
20.02.2004	19.04.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Gerber, M Telephone No. +49 89 2399-8528

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB 03/03201

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-33 as originally filed

Claims, Numbers

1-88 as originally filed

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-88
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-88
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-88
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: US-A-4 587 329
D2: US-A-6 113 946
D3: US-A-6 410 680

Preliminary remarks:

1. Although **claims 1, 3, 14, 82 and 86, as well as claims 59, 68, 70 and 85, or claims 77 and 80** have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought. The aforementioned claims therefore lack conciseness. Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection.

The relevant subject-matter is not defined in terms of a minimum number of independent claims in each category followed by dependent claims covering features which are merely optional.

Hence, **claims 1-88** do not meet the requirements of Article 6 PCT.

2. Claims 28, 57 and 66 contain a reference to the description (example). According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here.

3. Claims 29, 58, 69, 76, 79 and 88 are redundant with the claims from which they depend (Article 6 PCT).

4. Claims 59, 68, 70, 77, 80, 82 and 85 lack a reference to the product claims in order to define the hyperbranched polyamidoamine thus meant (Article 6 PCT).

1. Novelty

D2, which is considered to represent the most relevant state of the art, discloses a polynucleotide delivery system based on PAMAM cascade polymers synthesised from an ammonia initiator core from which the subject-matter of claim 1 differs in the structure of the core.

The subject-matter of **claims 1-88** is novel over the available state of the art (Article 33(2) PCT).

2. Inventive step

The problem to be solved by the present invention may therefore be regarded as to provide an effective and safe transfection agent based on polyamidoamine capable of delivering therapeutic genes to the patient.

None of the cited prior art documents, taken alone or in combination, would have led the skilled person faced with the above-mentioned problem to use a hyperbranched polyamidoamine as transfection agent. The polyamidoamine dendrimers of the state of the art are characterised by their regular structure and their centre of symmetry, whereas the claimed compounds lack a centre of symmetry. The skilled person would thus not have been prompted to adopt an irregular branched structure for transfecting polynucleotides.

The subject-matter of **claims 1-88** is therefore inventive (Article 33(3) PCT).

3. Industrial applicability

The subject-matter of present **claims 1-88** appears to comply with the requirements of industrial applicability as stipulated in Article 33(4) PCT.